

Self-Collapsing Soliton Envelope Projection System for Reflected EM Absorption and Forced Phase Cancellation for RADAR and Optical Stealth

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Introduction

In papers such as 13 January 2023, the possibility of using soliton waves as a mechanism for the detection of stealthy objects was being advanced by this author. Although this may be possible, helical beam RADAR offers a far more practical and effective approach to overcoming the challenge of detecting stealthy craft.

However, that same concept of using “soliton envelopes,” which is to say, rapidly pulsed soliton waves, may have an interesting application in the area of enhancing stealth when they are emitted from the integument of an aircraft or other object.

Abstract

The emission of a series of soliton waves at a spacing of about two microns would be ideal for achieving the goal of using emitted electromagnetism in the form of soliton waves in order to eliminate any reflected RADAR energy (as well as visible light or any other form of EM) after it begins to move away from the aircraft.

Firstly, it is important to understand that a soliton wave is a modified light wave which has been flattened and which acts as a magnetic monopole, wherein its north side tends to face in the direction of angular momentum and its south side to the rear.

It is a first-principle of physics that light will be slowed by magnetic fields. Although light does not generally create a strong magnetic field, soliton waves do. The north poles of the photons face consistently in the overall direction of travel whilst the spin of the photons is restricted to axis spin which maintains the orientation of the poles.

Thus, if we emit two soliton waves in rapid succession, something interesting could be expected to happen: The North pole of the second wave and the South pole of the first could be expected to influence one-another. Although the second wave cannot exceed the speed of light, the first wave can certainly be slowed to a value less than the speed of light. Eventually, the second wave would catch up with the first. Any standard EM trapped between the two walls of soliton energy would be gradually absorbed by them. This can occur because the shared direction of travel allows the soliton waves to affect the EM inside of the envelope over a period of time. When the two soliton waves meet, they undergo a type of phase cancellation. Rather than continuing to travel as a soliton wave or returning to standard phasing behavior, the photonic contents of the two waves (now containing within them the EM of the outgoing reflected RADAR energy as well as unintentionally generated energy

such as infrared from the heating of the aircraft's integument due to friction with the atmosphere) are scattered into individual photons traveling in a multitude of directions and outside of the context of structured waves. In essence, the same thing that happens to light during a conventional phase cancellation event happens to the soliton waves which form an envelope.

This photonic energy would dissipate long before reaching a detector and would amount to a slight ionization of the surrounding atmosphere. In this system, the soliton waves are acting as the RADAR absorbing material rather than a physical structure. These waves, because they have no property of frequency, are agnostic to the frequency of the energy they are intended to absorb. Employing a constant stream of emitted waves allows for even longer wavelengths of EM to be scattered. Because these waves have a tendency to scatter, particularly after the collapse of envelopes, the emissions do not serve to increase the signature of craft employing the system. An aircraft integument consisting of a series of glass nanospheres backed by precision waveguides and LEDs would be capable of producing the needed waves. The amplitude of the waves emitted may need to be increased to enable them to nullify EM of greater amplitude.

Conclusion

Objects cloaked by this system would appear to be black as any light striking the craft would be nullified. This system would have the additional substantial benefit of entirely negating the infrared signature produced by integument heating from friction with the atmosphere or from jet engine exhaust. Thus, it is able to reduce RADAR cross-section to a greater extent than RADAR-absorbing materials, but is also able to nullify its own infrared signature as well as frustrate LiDAR-based attempts to detect any craft protected by the system.